Division of the
State Architect
CALIFORNIA DEPARTMENT OF GENERAL SERVICES

DSA PROCEDURE 08-03

Revised in its entirety: 09-15-11
Revised: 12-15-09
Revised: 1-15-09
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Issued: 10-28-08

To: **DSA HQ and Regional Offices Staff**
School Districts, Design Professionals

From: **Division of the State Architect**
California Department of General Services

SUBJECT: **School Facility Program / Seismic Mitigation Program (June 22, 2011 adoption): DSA Review**

Purpose: This document sets forth the procedures to be followed by applicants seeking funding for seismic mitigation of eligible buildings under the Seismic Mitigation Program (SMP) for California K-12 public schools.

Background: The SMP is authorized by the Kindergarten-University Public Education Facilities Bond Act of 2006 (Proposition 1D) and School Facility Program (SFP) regulations [Title 2, California Code of Regulations, Section 1859.82(a)], and administered by the Office of Public School Construction (OPSC) on behalf of the State Allocation Board (SAB). Proposition 1D provided $199.5 million of State matching funds for seismic mitigation projects, and related ancillary costs, begun on or after May 20, 2006, that meet the eligibility requirements. SMP regulations can be found on the OPSC web site.

NOTE: This procedure corresponds to the amended program regulations adopted by the State Allocation Board on June 22, 2011, and approved by the Office of Administrative Law on September 8, 2011.

Overview: The following is a brief summary of the steps and the required submittals for DSA review and approval:

Phase (Section)	Required Submittals	DSA Fee	References
1. Verify Eligibility	Eligibility Evaluation Report submitted to the DSA Headquarters	$500	Appendix D: Eligibility Evaluation Report Template, ASCE/SEI 31-03
2. Replacement Option Analysis: (not required for Rehabilitation projects)	Structural Engineer's Report, Geotechnical Engineer's Report (if applicable), and Cost Estimate. DSA Headquarters reviews the scope of work in the request.	None	Section 2
3. Seismic Rehabilitation Pre-Application (not required for Replacement projects)	Evaluation and Design Criteria Report. Submit to the DSA Regional Office.	Initial fee of $2000 per building. Additional fees based on DSA review hours	ASCE/SEI 41-06, CBC Chapter 34, Title 24 Part 1 Section 4-306
4. Project Application	Construction Plans, Specifications, Calculations, Geologic Hazard Report, and Cost Estimate submitted to the DSA Regional Office	Standard plan review fee based on estimated construction cost (see Title 24, Part 1, Section 4-321)	Rehabilitation: ASCE/SEI 41-06, CBC Chapter 34 Replacement: CBC Chapter 16A
5. Seismic Mitigation Funding	See OPSC web site for applicable requirements including OPSC Facility Hardship Checklist & Form SAB 50-04	Not Applicable	Section 5

1. Phase 1 – Verify Eligibility:

Only buildings meeting the following eligibility criteria may be funded under this program. The school district must submit a completed Eligibility Evaluation Report (Appendix D) to demonstrate the proposed building meets these eligibility criteria. If your district has an eligible building that was repaired or replaced prior to the issuance of this Procedure, contact DSA Headquarters for direction.

1.1 Building Occupancy. Indicate whether the building was designed for occupancy by students and staff by providing the DSA application number for the original construction, or the applicable DSA number for projects involving pre-Field Act buildings per Education Code section 17367.

1.2 Structural System. Describe the structural system, using the definitions in the *Seismic Evaluation of Existing Buildings (ASCE/SEI 31-03), American Society of Civil Engineers, 2003,* for guidance in determining the structural system. Provide structural framing plan layout drawings/sketches or copies of the structural framing plans used for the original construction. The type of structural system must be one of the following:

- C1 – Concrete Moment Frames
- C1B* – Reinforced Concrete Cantilever Columns
- C2A – Concrete Shear Walls, Flexible Diaphragm
- C3A – Concrete Frame with Infill Masonry Shear Walls, Flexible Diaphragm
- PC1 – Precast/Tilt-up Concrete Shear Walls, Flexible Diaphragm
- PC1A – Precast/Tilt-up Concrete Shear Walls, Rigid Diaphragm
- PC2 – Precast Concrete Frames with Shear Walls, Rigid Diaphragm
- PC2A – Precast Concrete Frames without Shear Walls, Rigid Diaphragm
- RM1 – Reinforced Masonry Bearing Walls, Flexible Diaphragm
- S1B* – Steel Cantilever Columns
- S3 – Steel Light Frames
- URM – Unreinforced Masonry Bearing Walls, Flexible Diaphragm
- URMA – Unreinforced Masonry Bearing Walls, Rigid Diaphragm
- M* – Mixed Systems - building containing at least one of the above lateral-force-resisting systems in at least one direction of seismic loading.

* These structural systems are a subset of the classification in ASCE 31 and are defined in the Category 2 building types in the AB 300 Seismic Safety Inventory of California Public Schools report (2002).

1.3 Building Collapse Potential Due to Ground Shaking: Provide evidence that demonstrates that the building poses an unacceptable risk of injury to its occupants due to ground motions, as determined in ASCE/SEI 31-03. Additionally, describe in detail the specific deficiencies and reasoning for these conclusions for at least one potential collapse scenario. The ASCE/SEI 31-03, as amended per the report template contained in Appendix D, shall be used for the evaluation of the building performance level.

NOTE: If eligibility can be determined based on ground shaking, then it is not necessary to provide a geologic hazard report in this phase, as referenced in Section 1.4 of this procedure.

1.4 Building Collapse Potential Due to Faulting, Liquefaction, Landslides: If eligibility is based on the presence of faulting, liquefaction or landslide, a geologic analysis must be prepared and submitted to CGS.

Refer to Appendix B for reporting of ground faulting, liquefaction and landslides, and consult with the CGS [Jennifer Thornburg, (916)445-5488] prior to submittal of such reports to ensure a complete submittal. For additional information, please visit the CGS Web site at http://www.conservation.ca.gov/cgs/rghm/reviews/Pages/faq.aspx

Submit the reports to the address below and include a reference to the Seismic Mitigation Program:

Attn: Margaret Hyland
California Geological Survey
School Review Unit
801 K Street, MS 12-32
Sacramento Ca 95814

CGS will provide a letter to the school superintendent and provide a copy to the DSA and OPSC indicating whether or not CGS concurs with the characterization of the geologic hazard and expected magnitude of displacements.

The Eligibility Evaluation Report shall contain a structural analysis demonstrating a high potential for local or global collapse in the evaluation earthquake as a result of the displacements imposed on the structure due to the faulting, liquefaction, or landslide, as indicated in the CGS approved geologic hazard report. The structural analysis shall comply with California Building Code (CBC) Section 1604A.4. To ensure the analysis approach is acceptable, consult with DSA (contact below) prior to completing the evaluation report.

1.5 Submittal Requirements: The school district must submit a complete application Form DSA-4, application fee ($500), and an Eligibility Evaluation Report to DSA Headquarters (HQ).

Attn: Terence Fong
DSA-Headquarters
1102 Q Street, Suite 5100
Sacramento, CA 95811

The report must have the stamp or seal and signature of a California registered Structural Engineer.

The report and all related documents must be submitted in hard copy, accompanied by a CD containing all submitted documents.

Provide a separate application Form DSA-4, application fee, and report for each building even if the buildings are similar or identical in design and construction.

1.6 DSA Review: Submittals will be reviewed within 10 working days of receipt of a complete submittal. If eligibility is based on the presence of faulting, liquefaction or landslide, the report will require additional review time by DSA and CGS. CGS concurrence must be obtained in order for DSA to issue a letter confirming building eligibility for SMP.

DSA HQ will send a letter to the applicant, with copies to the school district superintendent, district facilities director or appropriate contact, structural engineer, and OPSC, indicating whether or not DSA concurs that the building is eligible for funding.

For buildings receiving a DSA concurrence letter, the applicant may proceed to Phase 2 or 3, as applicable.

2. Phase 2 – Replacement Option Analysis:

To ensure compliance with SFP Regulations, Section 1859.82(a)(1), C.C.R., a school district seeking funding to replace an eligible building must demonstrate that the estimated cost of rehabilitation is equal to or greater than 50 percent of replacement value (replacement value is determined by OPSC in accordance with SFP regulations). SFP regulations also require DSA concurrence with the scope of the minimum work required to rehabilitate an eligible building. To obtain DSA

concurrence, a school district must submit a structural engineer's report to DSA Headquarters, to the address given in Section 1.5). The report must contain the following as applicable to the building deemed eligible in Phase 1:

- Detailed description of seismic deficiencies.
- Description of minimum work needed to mitigate seismic deficiencies.
- Description of accessibility and fire and life safety upgrades. To determine applicable required work for fire and life safety and accessibility upgrades, refer to CBC Chapter 34 and Appendix C of this Procedure.
- Schematic plans for the above work.
- Cost estimate for the above work (summary cost estimate, i.e. square footage basis).

To ensure timely processing, the report must be accompanied by a cover letter requesting Phase 2 concurrence review. Include the Project Tracking Number (PTN) shown on the DSA-4 form submitted in Phase 1.

Upon review and concurrence, the DSA will issue a letter to the applicant and provide a copy to the school district superintendent, facilities director, structural engineer, and the OPSC. The school district may proceed to Section 4 below.

NOTE: For projects involving liquefaction or landslides as the geologic hazard contributing to the collapse potential of the eligible building, a geologic hazard report will be required to document the potential for building displacement and recommended site improvements to mitigate the hazard. Such report shall be submitted to CGS for review if the geologic hazard report submitted in the eligibility phase (refer to Section 1.4 above) did not address the selected mitigation measures.

For projects involving faulting as a hazard contributing to the collapse of a building, a Geologic Hazard report is not required as this hazard cannot be mitigated and the building must be replaced.

3. Phase 3 – Seismic Rehabilitation Option:

The approval of a rehabilitation plan is a two-step process that includes the filing of the pre-application and the project application. The pre-application will establish the criteria for evaluation and design, material testing and condition assessment requirements, and is described in this Section. The project application will include the design development of construction plans, specifications, and calculations, using the criteria established in the pre-application, as described in Section 4.

3.1 Pre-Application: The District must submit to DSA a pre-application, form DSA-1.REH, required fees in accordance with Title 24 Part 1 Section 4-326, and an Evaluation and Design Criteria Report per Title 24 Part 1, Section 4-306 and CBC Sections 3417.4, 3419, and 3423.1. The Evaluation and Design Criteria Report shall also include the proposed fire and life safety and accessibility criteria (see Appendix C).

3.2 Scope of Work: Rehabilitation projects funded by SMP shall be designed to meet the current CBC requirements for seismic rehabilitation. For the 2010 CBC, seismic rehabilitation shall be designed in accordance with Sections 3417 to 3423 utilizing the performance requirements in CBC Table 3417.5 for "public schools".

A seismic rehabilitation includes strengthening of all structural elements that do not comply with ACSE 41, Section 2.3.2 - *Systematic Rehabilitation Method* and is not limited to those deficient items found in the ASCE/SEI 31-03 analysis described in Section 1, above.

In addition, the seismic rehabilitation requires a full inventory, analysis, and strengthening, where required, of the non-structural components of the building in

accordance with Section 11 in ASCE/SEI 41-06 utilizing the criteria in CBC Table 3417.5 and as outlined in CBC Section 3419.9. See Appendix C for applicable requirements for fire and life safety and accessibility.

Seismic rehabilitation projects under the SMP will be subject to a structural rehabilitation (wind and seismic force requirements) per 4-306 if alterations to the existing structural components, or additions of new structural components, exceed the limitation of Title 24, Part 1, Section 4-309(c)2. The cost trigger for structural rehabilitation in Title 24, Part 1, Section 4-309(c)1 need not apply to seismic rehabilitation projects under the SMP since the cost of the seismic rehabilitation need not be included in this cost analysis. Conversely, the seismic rehabilitation costs shall be included in the Replacement Option Analysis in Section 2.

NOTE: A project consisting of repairs designed pursuant to only Section 3419.12, Part 2, Title 24 CCR (voluntary modifications to the lateral-force-resisting system) is not eligible for funding under the SMP. Only seismic rehabilitation in accordance with Section 3.2 of this Procedure will be eligible for SMP funding.

3.3 DSA Review: Upon review and approval of the Evaluation and Design Criteria Report, the DSA will date, sign, and stamp the report with the applicable REH application number. An REH application number is assigned to a project prior to the DSA Application number to facilitate tracking of rehabilitation projects. The Evaluation and Design Criteria Report shall be used to prepare the project submittal per Section 4.

4. Phase 4 – Project Application:

Replacement projects do not require an Evaluation and Design Criteria Report per Section 3.1 above as a prerequisite for submittal of plans.

The applicant should contact the DSA Regional Office to schedule a design phase consultation to facilitate in preparing a complete submittal. This meeting should include verification of certification of prior construction projects involving the eligible building(s), and the scope of fire and life safety and accessibility upgrades to be included in the rehabilitation project.

4.1 Submittal: The submittal must include *Application for Approval of Plans and Specifications* (Form DSA-1), *Project Submittal Checklist* (Form DSA-3) along with all applicable documents, the required fees in accordance with Title 24, Part 1, Sections 4-321 and 4-324, geologic hazard report in accordance with DSA IR A-4, construction plans, specifications, design phase meeting minutes (if applicable), and a cost estimate. Submit the package to the appropriate DSA Regional Office. DSA will assign a project application number.

4.2 Cost Estimate: For rehabilitation projects, per the requirements of SFP Regulations, Title 2, Section 1859.82(a)(1)(B), C.C.R, , the district must supply a detailed cost estimate of the minimum work required for the seismic rehabilitation and related required fire and life safety and accessibility upgrades. DSA suggests the cost estimate be based on 90 percent construction documents, using Construction Specifications Institute format including section references, material quantities and unit costs. Unrelated work (example: HVAC replacement, IT upgrades) must be clearly segregated out in the cost estimate. The DSA will review the scope of work in the cost estimate to verify the scope of minimum required work, and will issue a concurrence letter to the applicant and provide a copy to the school district superintendent, facilities contact, structural engineer and the OPSC.

4.3 DSA Review: The DSA Regional Office will review the construction documents and, upon determining compliance with CBC requirements for school buildings, issue a Plan Approval letter. Consult the DSA Regional Office regarding expected timeline of review and approval of projects.

5. Phase 5 – Seismic Mitigation Funding:

Upon receipt of DSA Plan Approval letter, the school district must forward a copy of the letter to the Office of Public School Construction (OPSC) as a part of its application for funding (Form SAB 50-04), along with any other applicable documents.

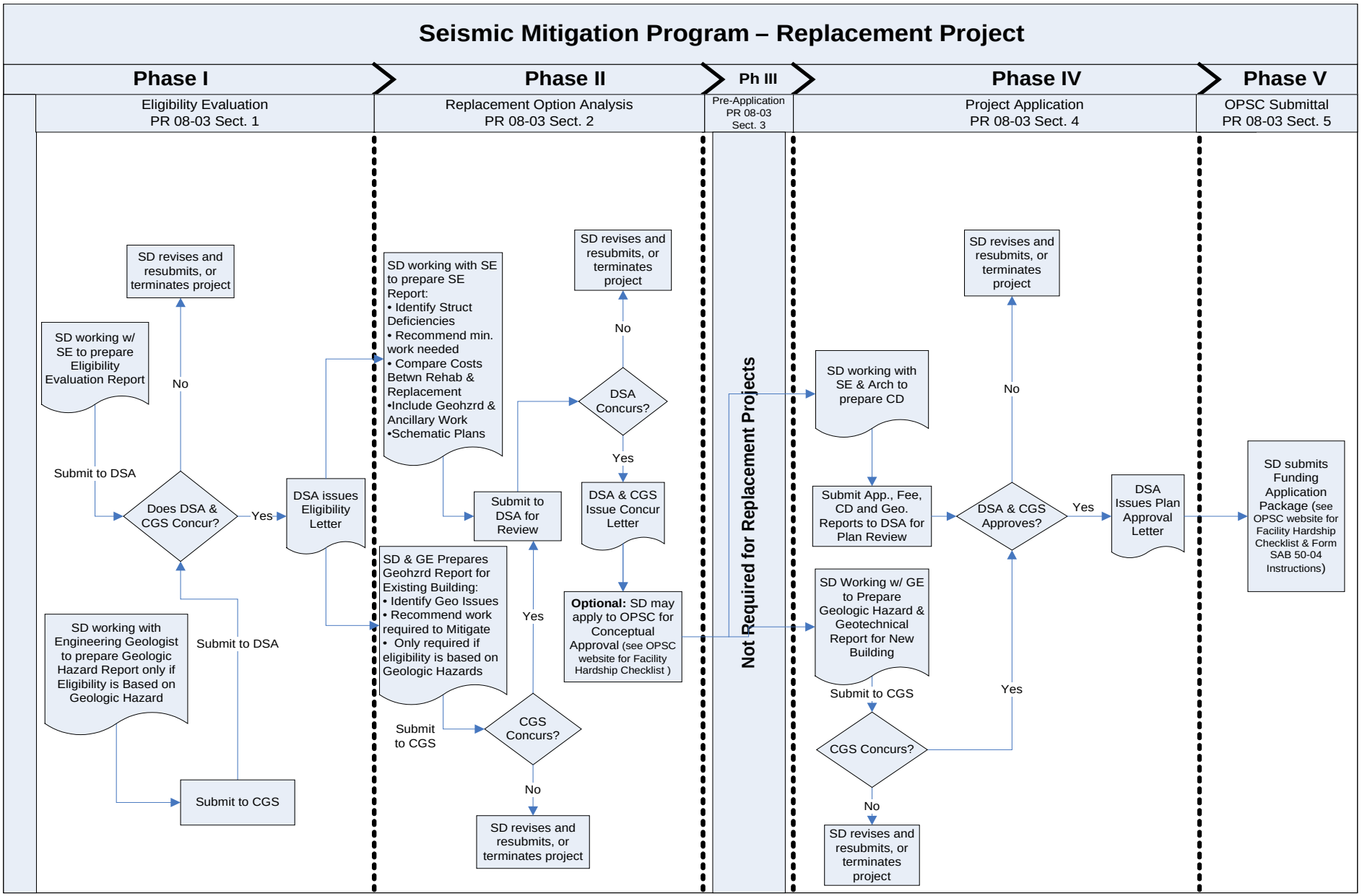
Any questions related to funding available for the Seismic Mitigation Program, including eligibility for various grants and allowances, should be directed to Ms. Karen Mandell, Supervisor of the Facility Hardship Program Team at Karen.Mandell@dgs.ca.gov or (916) 376-8959.

Appendix A: Process Flow Charts

Appendix B: Documenting Geologic Hazards for SMP Projects

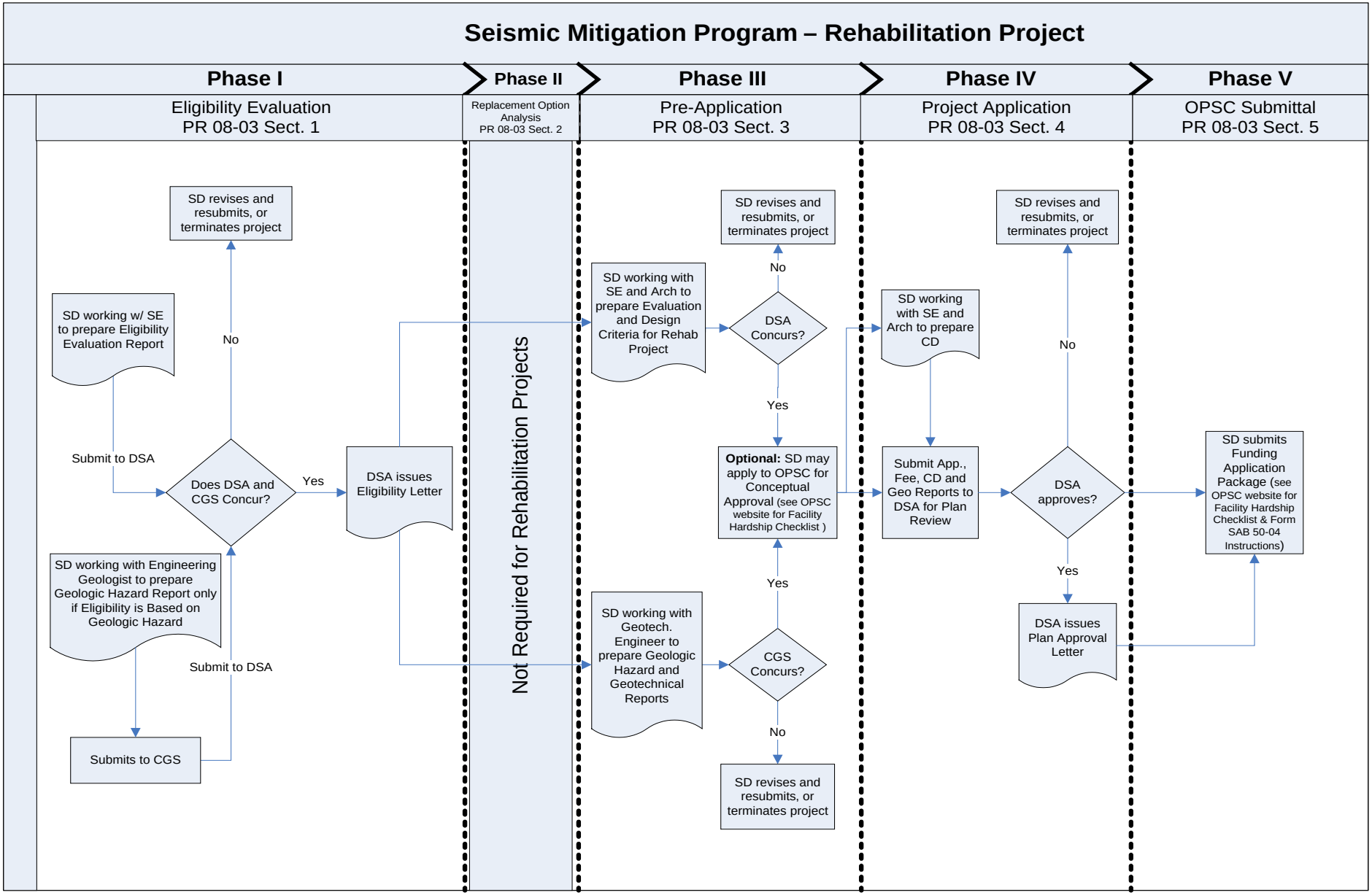
Appendix C: Guidelines for Determining Fire Life Safety and Accessibility Requirements

Appendix D: Eligibility Evaluation Report Template



Key to Abreviations:
CD=Construction Document, CGS=California Geologic Survey, DSA=Division of the State Architect, GE=Geotechnical Engineer, OPSC=Office of Public School Construction, SAB=State Allocation Board, SD= School District SE= Structural Engineer

Disclaimer: This flowchart is intended as a general guide and tool for district use.



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Disclaimer: This flowchart is intended as a general guide and tool for district use.

Appendix B – Documenting Geologic Hazards for SMP Projects

Introduction: If eligibility for Proposition 1D funding is based on the presence of faulting, liquefaction or landslide, a geologic analysis must be prepared and submitted to CGS.

Procedure: For each building evaluated for SMP eligibility, provide evidence that the geologic hazard is present on the site, and provide the anticipated magnitude of surface displacement in accordance with the guidelines below. Displacement results must be sufficiently detailed for structural engineers to use in their analysis of structural performance. These analyses are not typical geotechnical engineering or engineering geology practice, and each project will be reviewed for scientific credibility on its own merit. Supporting site data must be presented, and must be shown to be directly relevant to the structure being evaluated. Adequate scientific justification for all interpretations must be presented. Overly "conservative" approaches may result in unreasonably large estimates of displacement which, for this program, will be questioned by CGS.

Resources: See these documents for guidance (all are available online):

- California Geological Survey Note 48, 2011, Checklist for the Review of Engineering Geology and Seismology Reports for California Public Schools, Hospitals, and Essential Services Buildings (PDF – 95 KB).
- California Geological Survey, 2008, Guidelines for Evaluating and Mitigating Seismic Hazards in California, CGS Special Publication 117A (PDF – 1.24 MB).
- Martin, G.R. and Lew, M., 1999, Recommended Procedures for Implementation of DMG Special Publication 117: Guidelines for Analyzing and Mitigating Liquefaction in California; Southern California Earthquake Center (PDF – 2.13.MB).
- Blake, T.F. Hollingsworth, R.A., and Stewart, J.P., 2002, Recommended Procedures for Implementation of DMG Special Publication 117: Guidelines for Analyzing and Mitigating Landslide Hazards in California, Southern California Earthquake Center (PDF – 3.24 MB).
- California Geological Survey Note 49, 2002, Guidelines for Evaluating the Hazard of Surface Fault Rupture (PDF – 350 KB).

1. LIQUEFACTION: Engineering Geologists or Geotechnical Engineers working for the school district as consultants should estimate displacement of ground surface assuming the site is subject to peak ground acceleration (PGA) calculated as $S_{DS}/2.5$, and historical high ground water level. The consultants should show how PGA and ground-water parameters are derived. Adequate site-specific density data should be provided through boring logs, CPT correlated with borings, or down-hole shear-wave velocity data. Vertical and lateral extent of liquefiable layers should be shown in geologic cross sections.

Show calculations to document one or more of the following failure mechanisms:

1.1 Loss of bearing capacity

- Report undrained residual bearing capacity and analyze the potential for punching shear failure.

1.2 Lateral spread

- Provide geologic cross section showing extent of lateral spread with respect to the building. Indicate if the building is on the margins of expected lateral spread, or if it lies within a recognizable coherent block.
- Report vertical and lateral displacement at the location of the structure.

1.3 Differential settlement

- Using a factor of safety for liquefaction of 1.3, report maximum differential settlement across the building footprint.
- Actual differential settlement must be supported by two or more borings. Assumption of some fraction of total liquefaction settlement will not be accepted.
- Dry seismic settlement above the historical high ground-water level will not be considered for this program.

2. SEISMICALLY INDUCED LANDSLIDES: Evaluate the potential for ground failure assuming the site is subject to PGA calculated as $S_{DS}/2.5$.

2.1 Site Geologic Map: Present a site geologic map and one or more geologic cross sections showing the relationship between topography, geologic units, existing or modeled slide planes, and all structures such as retaining walls and buildings. At least one cross section should be drawn along the critical profile for stability analyses. Document surface and subsurface observations, including evidence of slope movement, building distress, slope monitoring data, and depth and extent of slip surfaces or planes of weakness. Indicate if the building is on the landslide margin or recognizable graben feature, or if it lies within a recognizable coherent block. Justify assumptions regarding ground water, and provide evidence for unit weight and shear strength values used in slope stability calculations.

2.2 Slope stability profiles should be based on the geologic cross sections. If the slope fails a pseudostatic screening procedure, estimate vertical and horizontal earthquake-induced displacement at the location of the structure, and demonstrate whether the building straddles a critical slip surface or will be subject to severe deformation due to the modeled slope movement.

3. Surface Fault Rupture: A probabilistic fault displacement analysis is not a practical approach at this time for most sites. Therefore, any Holocene-active fault will be considered to have sufficient *probability* of rupture, and an estimate of expected surface displacement should be presented. Unusually large displacement estimates will be carefully considered by CGS. CGS should be provided an opportunity to review in the field any new exploratory fault trenches excavated at the site. The project geologist is strongly encouraged to discuss the site with CGS prior to embarking on the fault investigation.

The consultants should provide evidence of the existence of Holocene surface rupture within the footprint of the building. Given the maximum characteristic magnitude on the main trace of this fault and the characteristics of the splay underlying the building, estimate both vertical and horizontal components of fault displacement. The consultants' analysis should be fully explained, and will be critically reviewed by CGS.

If the building is eligible for funding under the Seismic Mitigation Program due to surface fault rupture, the rehabilitation option is not allowed since rehabilitated buildings must meet current building code requirements, which is not possible for a building within 50 feet of a Holocene-active fault. Therefore, the building must be abandoned and replaced, rather than rehabilitated.

Appendix C– Guidelines for Determining Fire Life Safety and Accessibility Requirements

C.1 Fire Life-Safety Requirements:

C.1.1 Fire and Life Safety provisions shall apply strictly to area(s) of rehabilitation work within the scope of proposed improvements [2010 California Building Code (CBC), Chapter 34, Sections 3401.4.1, 3405.1.1, and 3412.2].

C.1.2 Whatever portions of the building are demolished, new construction will be reviewed under current provisions of the California Building Code.

C.1.3 In compliance with 2010 CBC, Section 3423.1 (1) applicant shall include in the "Evaluation and Design Criteria Report" the following information pursuant to the code edition applicable at the time of original plan approval.

a) A complete building code analysis that includes construction type, building height and area, allowable building size increases, and occupancy group(s).

b) Identify means of egress configuration and characteristics in the building. Information shall include dead-ends where two or more exits are required, and travel distances. Rehabilitation work that affects the means of egress may generate additional requirements.

c) Identify location and type of fire rated construction; including corridor walls and vertical openings. Through membrane penetrations of rated systems will require a fire-rated fire stop system with the same or greater hourly rating as the violated rated construction.

d) Existing building fire rated components that require asbestos abatement within scope of work, shall be reconstructed with rated equivalent materials as needed to maintain fire-rating.

e) Identify existing individual room occupancy group as noted on original approved plans. Identify if occupancy group(s) have changed from approved plans. Change of use in any room would require current code provisions to be met.

f) Identify the HVAC system's ability to resist the movement of smoke and fire beyond the point of origin. HVAC systems that are impacted by the rehabilitation, and incorporate smoke detector shut down, shall be tested prior to approval of the project to verify correct operation of the system. In the event that system does not function as originally designed, repairs or replacements will be required for automatic shut down feature.

g) Provide an evaluation of fire alarm and fire suppression system features of the building. Where a system, or portion of a system, is temporarily removed to allow seismic upgrades, a complete test will be required of the system to verify correct operation of the system after it has been re-installed. Test(s) shall be in accordance with National Fire Protection Association Standards. In the event that the system or components of the system are found not operable, repairs or replacements will be required.

C.1.4 Compliance Alternatives may be considered as found in the 2010 CBC, Chapter 34 Section 3412. Evaluations may trigger additional scope of work.

C.2 Access Compliance Requirements: The Seismic repair of an existing facility is governed by 1134B.1 of the 2010 CBC. In addition, In Legal Opinion No. 94-1109, dated May 10, 1995, the Attorney General for the State of California concluded that seismic strengthening work in an existing building constitutes a "building alteration, structural repair or addition" for purposes of providing access to the building for persons with disabilities.

In existing buildings or facilities, if seismic strengthening or upgrade work does not alter the primary use or function of the building or facility and/or does not alter the design of specific rooms or spaces, then the requirement for an accessible path of travel to the area of specific alteration does not apply. However, the requirement to provide an accessible primary entrance, sanitary facilities, drinking fountains, signs and public telephones, as well as an accessible path of travel connecting these elements comply with the currently effective regulations.

In existing buildings or facilities, when the primary use or function of the building or facility and/or design of specific rooms or spaces are altered, the seismic strengthening or upgrade work must comply with all applicable accessibility regulations for new construction. In addition, the obligation to provide an accessible primary entrance to the building or facility and primary path of travel to the specific area of alteration, including sanitary facilities, drinking fountains, signs, and public telephones serving the area must be met.

ELIGIBILITY EVALUATION REPORT
Template Instructions

The Eligibility Evaluation Report template has been provided to aid the client in creating a report, and as an aid for consistency in format to facilitate DSA review.

NOTE: The template appearing as Appendix D in DSA Procedure PR 08-03 is provided for informational purposes only. The actual template that should be used is made available as a Microsoft Word file on the DSA Web Site, publications page at PR 08-03 - SMP Template.

These instructions are in addition to those provided within the template itself.

- This instructions page is to be removed from the final report.
- ***Bold italic*** text in the template is instructional information to guide the user. This text may be deleted in the final report.
- Some required input is indicated by underlines. Typing over rather than inserting text is recommended when filling these in. Remove underlining.
- Input is required in header and footer sections.
- Some input sections are in tabular format. Borders are provided as an aid in locating the data entry points. Borders may be removed.
- In order to place an "X" into a check box, right click on it and change its property from "Not Checked" to "Checked".
- See Section 5 of the template for additional instructions on how to make selections in the ASCE 31 Evaluation Statements.
- See PR 08-03 for additional instructions on submitting the Eligibility Evaluation Report to DSA.

This is a template document intended to ensure complete and consistent reports. Use of this template is mandatory for application to the SFP Seismic Mitigation Program, per DSA Procedure 08-03[1].

The purpose of this evaluation report is to establish eligibility for retrofit funding under Proposition 1D (AB 127, 2006). It is not the intent of this evaluation to provide a complete Life Safety evaluation. The evaluation is complete when eligibility has been determined.

Report Outline

1. Eligibility check summary
2. Evaluation process
3. Site and building description
4. Deficiency list
5. ASCE 31 Evaluation statements

In addition provide the following supporting documentation as applicable and use the following references:

Appendix A.1. Structural calculations
Appendix A.2. Evaluation statement notes
Appendix A.3 Photographs and details

SE Firm Name (Logo optional)

SE Address: _____

_____

Phone: _____ _____

(website or email address optional) *Name of SE whose stamp is above*

1. Eligibility Check Summary

	YES	NO
1.1 Building Occupancy: The building's current or planned use involves regular occupancy by students and staff, as detailed in Section 3.2.	☐	☐
1.2 Structural System: The building's seismic force-resisting system includes at least one of the types listed in Section 3.5.	☐	☐
1.3 Collapse Potential: The building has deficiencies associated with a high potential for local or global collapse in the evaluation earthquake. See Sections 4 and 5 for a list of identified deficiencies. Among the identified deficiencies are the critical items checked in Section 1.3.3:	☐	☐

If any "No" box in Sections 1.1, 1.2 or 1.3 was checked, the proposed building is not eligible. Stop and do not submit Eligibility Evaluation report. Otherwise continue below.

[1] "DSA Procedure 08-03," California Department of General Services, Division of the State Architect, latest edition.

1.3.1 ☐ Collapse Potential Due to Ground Shaking: Ss = X.XX

1.3.2 Collapse Potential Due to One of the Following Geologic Hazards (CGS Approved Geologic Hazard Report Required):

☐ LIQUEFACTION ☐ SLOPE STABILITY FAILURE ☐ SURFACE FAULT RUPTURE

1.3.3 Identified Deficiencies:

☐ LOAD PATH
☐ WEAK STORY
☐ SOFT STORY
☐ VERTICAL DISCONTINUITIES
☐ MASS
☐ TORSION
☐ ADJACENT BUILDINGS
☐ MEZZANINES
☐ SHEAR STRESS CHECK (COLUMN)
☐ AXIAL STRESS CHECK
☐ FLAT SLAB FRAMES
☐ CAPTIVE COLUMNS
☐ BEAM BARS
☐ DEFLECTION COMPATIBILITY
☐ FLAT SLABS
☐ REDUNDANCY
☐ UNREINFORCED MASONRY BEARING WALLS
☐ SHEAR STRESS CHECK (SHEAR WALL OR INFILL)
☐ REDUNDANCY (SHEAR WALL)
☐ OPENINGS AT SHEAR WALLS
☐ TOPPING SLAB
☐ WALL ANCHORAGE
☐ OTHER *

If OTHER is selected, the Engineer must edit/complete the following sentence with brief description of one or two most-critical items, with reference to severity, extensiveness, critical location, or other aggravating factors. Coordinate with Section 4.

* This building is considered to have a high potential for local or global collapse in the evaluation earthquake because

2. Evaluation Process

2.1 Purpose and Scope

As described in DSA Procedure 08-03, the primary purpose of this evaluation is to confirm the subject building's eligibility for Proposition 1D (AB 127, 2006) retrofit funding.
As noted in DSA Procedure 08-03, the intent of this evaluation is to identify conditions that represent "a high potential for catastrophic collapse." As described further in Sections 2.2 through 2.4, the evaluation includes:

- Completion of a standardized checklist developed specially for this project (Section 2.2). As described in Section 2.2, once a critical deficiency is confirmed, the balance of the checklist need not be completed.
- A site visit (Section 2.3)
- Document review (Section 2.4)

It is not the intent of this evaluation to provide a complete Life Safety evaluation; earthquake safety hazards other than those listed in this report might exist. Further, it is not the intent of this evaluation to identify deficiencies with respect to post-earthquake use or recovery feasibility. In particular, except where specifically noted, the scope of this evaluation does not include:

- Material testing or destructive investigation
- Comprehensive condition assessment or verification of construction documents
- Assessment of code compliance, either at present or at the time of construction
- Assessment for load combinations not including earthquake effects
- Consideration of Life Safety hazards related to egress
- Consideration of Life Safety hazards related to hazardous materials
- Consideration of the effects of damage to nonstructural components or contents.

Building located on sites with geologic hazards (liquefaction, slope failure, faulting) may be eligible for the Proposition 1D funding if it can be demonstrated that the geologic hazard may cause the building to have a high potential for catastrophic collapse. In this case, a geologic hazard report shall be prepared and submitted to CGS for approval and a copy included with evaluation report. The geologic hazard report shall identify the resulting displacements that will be imposed on the structure so a structural analysis can be performed. If eligibility is being sought for a deficiency that is not related to geologic hazards, then a geologic hazard report does not need to be prepared for the purpose of this evaluation report.
With respect to DSA Procedure 08-03, this report fulfills the intent of its Section 1. The remaining sections of Procedure 08-03 are outside the scope of this evaluation and report:

2.2 Evaluation criteria: Modifications to ASCE 31

As noted in DSA Procedure 08-03, the evaluation applies ASCE 31[2], an engineering standard that allows the user to choose a performance level of either Life Safety or Immediate Occupancy. Procedure 08-03 suggests that Life Safety is the performance level of interest, but the Procedure also focuses on collapse, a lesser performance level not explicitly addressed by ASCE 31. For this evaluation, DSA has clarified that only collapse-prone conditions need to be identified. Further, because the focus of this evaluation is on checking eligibility for retrofit funding, as opposed to producing a comprehensive list of potential deficiencies, the full evaluation need not be completed once a critical deficiency is identified.

[2] *Seismic Evaluation of Existing Buildings* (ASCE/SEI 31-03), American Society of Civil Engineers, 2003.

ASCE 31 involves three "tiers" of evaluation. Tier 1 uses a set of generic, mostly qualitative "evaluation statements" (also called checklists) to identify potential deficiencies. Tier 2 applies more quantitative checks to confirm or correct the Tier 1 findings. Tier 3 involves a more thorough structural analysis. For this evaluation, DSA has clarified that only Tier 1 is required for most issues, with Tier 2 evaluation for specific issues.

The criteria used for this evaluation therefore are based on the ASCE 31 Tier 1 checklists, with the following modifications:

- Basic Structural, Supplemental Structural, and Foundations checklists are considered.
- Nonstructural checklists are excluded. While some issues addressed by these checklists are relevant to nonstructural collapse potential, their completion is beyond the scope of this evaluation. While not considered for purposes of establishing funding eligibility, relevant deficiencies will be investigated and addressed during a retrofit design phase.
- Evaluation statements required by ASCE 31 for Immediate Occupancy only are excluded.
- Evaluation statements not associated with one of the eligible structure types are excluded.
- Certain evaluation statements related to "critical deficiencies" indicative of a high potential for structural collapse are identified. If a critical deficiency is confirmed, the balance of the evaluation need not be completed. The critical deficiencies are those listed in Section 1. They were selected by DSA for this project based in part on precedents set by the California Office of Statewide Health Planning and Development.[3]
- For Quick Checks and Tier 2 evaluations, the ASCE 31 criteria for Life Safety performance are used, except that *m* values, where needed, are increased by an additional factor of 1.33.
- The Tier 1 evaluation statements are modified to reflect emphasis on collapse-level performance:
    - Since the presence of an unreinforced masonry bearing wall system is deemed a critical deficiency, an evaluation statement to that effect is added, and detailed ASCE 31 evaluation statements specific to that system are omitted.
    - Condition of Materials: Evaluation statements are edited to focus less on presence of damage and more on significance of damage. Note that Masonry Lay-up and Foundation Performance evaluation statements are relocated to the Condition of Materials subsection of Section 5.
    - Except for cracks in certain concrete members, Condition of Materials evaluation statements related to existing cracks are omitted.
    - Beam Bars: The requirement for 25 percent of the joint bars to be continuous for the length of the member is removed.
    - Redundancy (Moment frame and Braced frame): The requirement for two bays per frame line is removed.
    - Stiffness of wall anchors: The limitation of 1/8-inch gap prior to anchor engagement is removed.
    - Overturning: This statement is removed.
    - In general, statements are modified for clarity and consistency with this DSA program.
- Tier 2 evaluation is required for any critical item (see Section 1) found to be non-compliant by Tier 1. The potential requirement for full-building Tier 2 evaluation found in ASCE 31 Table 3-3 is waived.

[3] *2007 California Building Standards Administrative Code (California Code of Regulations, Title 24 Part 1)*, Chapter 6, "Seismic Evaluation Procedures for Hospital Buildings," Section 1.4.5.1.2, October 23, 2008 Emergency Supplement.

2.3 Document review

The following documents were provided for use in completing the evaluation, in general compliance with ASCE 31, Section 2.2. The Set ID is used to identify the documents cited in Section 5 of this report.

For each document (set of plans, report, etc.), give the title and author, indicate the number of sheets or pages (especially if only part of the set was available), and state the context in which the document was produced (original construction, alteration, retrofit, repair, etc.)

SET ID	DATE	DESCRIPTION

2.4 Site visit

In general compliance with ASCE 31, Sections 2.2 and 2.3, a site visit shall be made to verify the building configuration and conditions and to assist in completing the evaluation.

Date of site visit: _____

Visiting engineer(s) and staff: _____

School district contact person: _____

School campus representative (if different than above): _____

The scope of the site visit was based on our judgment, accessibility of certain areas, and convenience of the school on-site liaison. The purpose of the following list is merely to record the work that was done. The site visit included (check all applicable boxes):

Engineer may add optional notes after each item to clarify the scope, make specific observations, reference photographs in Appendix, suggest need for destructive investigation, etc.

- ☐ INTERVIEW W/ ON-SITE LIAISON
- ☐ GROUNDS, FOR OBSERVATION OF SOIL, SLOPES, DRAINAGE, GENERAL CONDITION
- ☐ EXTERIOR OBSERVATION TO VERIFY BASIC MASSING, CONFIGURATION, GENERAL CONDITION
- ☐ INTERIOR OBSERVATION TO VERIFY USE, WALL LINE CONFIGURATION, GENERAL CONDITION
- ☐ ROOF
- ☐ BASEMENT
- ☐ CEILING PLENUM
- ☐ UNFINISHED SPACES (MECHANICAL ROOMS, CLOSETS, CRAWL SPACES, ETC.)
- ☐ DETAILS OF STRUCTURE-ARCHITECTURE INTERACTION
- ☐ ROOF-TO-WALL CONNECTIONS
- ☐ GRAVITY SYSTEM FRAMING
- ☐ SEISMIC FORCE RESISTING SYSTEM ELEMENTS OR COMPONENTS
- ☐ ADJACENT BUILDINGS SUBJECT TO POUNDING
- ☐ OTHER:

Engineer to edit and/or complete the following paragraph as needed, using the table format for more detailed descriptions:

The site visit confirmed that the existing structure generally conforms to the available drawings listed in Section 2.3, with the following exceptions:

SET ID	CONDITION SHOWN ON PLANS	CONDITION OBSERVED AT SITE VISIT

3. Site and Building Description

3.1 Building description

General

Year originally built: _____

DSA Application number _____ ☐ Original Construction ☐ Work done pursuant to the Garrison Act (Ed Code 17367)

Number of stories above grade: _____

Number of stories below grade: _____

Total floor area (sq ft, approx): _____

Other essentially identical buildings on this campus? ☐ Yes ☐ No

Note construction of similar age, style, and size on this campus. Indicate if the similar buildings are being evaluated with separate reports, and if not, why not.

Photographs

Provide one or two exterior elevation photographs sufficient to give a general sense of the building's massing.

- ***Complete the caption, as shown below, above each photo box by adding a compass direction and the date of the photo.***
- ***Additional annotations (north arrow, grid lines, etc. to match the plan sketch below) are useful but optional.***
- ***If two photos are provided here, provide a similar caption above the second photo.***

Additional photographs, if needed, should be provided in Appendix A.2 or A.3.

Exterior elevation photograph, looking, _____ taken : _____
(DIRECTION) (DATE)

Ground floor plan

Provide a rough plan sketch of the first story showing:

- ***Plan configuration, with approximate overall dimensions***
- ***Substantially different parts of the building – original v. additions, different heights, different uses, etc.***
- ***Grid lines or key notes, so that other sections of this report can reference certain areas or SFRS elements consistently***
- ***If convenient, the location and orientation of key SFRS walls and frame lines***

Project North arrow

3.2 Building Occupancy

Original, current, and planned uses of the building include those indicated here:

Use this table to record observed or reported information about the original, current, and planned future uses of the building. Check all boxes that apply

	Original Use	Current Use	Planned Future Use
Office / Administration	☐	☐	☐
Classrooms / Instruction Areas	☐	☐	☐
Kitchen	☐	☐	☐
Assembly: Dining	☐	☐	☐
Assembly: Auditorium	☐	☐	☐
Assembly: Gymnasium	☐	☐	☐
Locker rooms	☐	☐	☐
Patio cover / bus shelter / walkway cover	☐	☐	☐
Bleachers / stadium structure	☐	☐	☐
Other occupied: ***complete as appropriate***	☐	☐	☐
Mechanical / utility rooms or enclosures	☐	☐	☐
Bulk storage	☐	☐	☐
Vacant / unused	☐	☐	☐
Other unoccupied:	☐	☐	☐

Based on the completed table, answer the first eligibility question in Section 1. If all the current and planned future uses are mechanical, bulk storage, vacant, or other unoccupied uses, answer the eligibility question "No."

3.3 Seismicity

Latitude: _____

Longitude: _____

Site Class per ASCE 31, Section 3.5.2.3: _____

Basis for Site Class determination: _____

Indicate whether class is based on default or on known soil properties. If known, cite the Set ID and page/detail from the list in Section 2.3.

Period [sec]	Mapped MCE values from ASCE 7-05 [g]	Site Coefficients from ASCE 31 Tables 3-5, 3-6	Design values per ASCE 31 section 3.5.2.3.1 [g]	S_a per ASCE 31 section 3.5.2.3.1, [g]
0.2	S_S =	F_a =	$S_{DS} = (2/3)\ S_S\ F_a$ =	$S_{a,0.2} = S_{DS}$ =
1.0	S_1 =	F_v =	$S_{D1} = (2/3)\ S_1\ F_v$ =	$S_{a,1.0} = \min(S_{DS}, S_{D1}/T)$ =

3.4 Gravity System

For each item below, briefly describe the structural material and structural elements.

Roof diaphragm and framing: _____

Typical floor diaphragm and framing: _____

Ground floor framing: _____

Vertical load-bearing elements: _____

Basement walls: _____

Foundation: _____

Snow load for use in load combinations involving earthquake: _____

Give the required snow load, if applicable. See ASCE 31 section 3.5.2.1 or 4.2.4.2. If not applicable, enter "Snow load not required."

3.5 Structural System per ASCE 31 Classifications (Category 2 Buildings Types per AB 300 Report)

		North-South	East-West
C1	Concrete Moment Frames	☐	☐
C1B*	Reinforced Concrete Cantilever Columns	☐	☐
C2A	Concrete Shear Walls, Flexible Diaphragm	☐	☐
C3A	Concrete Frame with Infill Masonry Shear Walls, Flexible Diaphragm	☐	☐
PC1	Precast/Tilt-up Concrete Shear Walls, Flexible Diaphragm	☐	☐
PC1A	Precast/Tilt-up Concrete Shear Walls, Rigid Diaphragm	☐	☐
PC2	Precast Concrete Frames with Shear Walls, Rigid Diaphragm	☐	☐
PC2A	Precast Concrete Frames without Shear Walls, Rigid Diaphragm	☐	☐
RM1	Reinforced Masonry Bearing Walls, Flexible Diaphragm	☐	☐
S1B*	Steel Cantilever Columns	☐	☐
S3	Steel Light Frames	☐	☐
URM	Unreinforced Masonry Bearing Walls, Flexible Diaphragm	☐	☐
URMA	Unreinforced Masonry Bearing Walls, Rigid Diaphragm	☐	☐
M*	Mixed Systems - construction containing at least one of the above lateral-force-resisting systems in at least one direction of seismic loading.	☐	☐

List the structural system(s) here.

_____

None of the above ☐ ☐

List the present structural system(s) here.

_____

* These structural systems are a subset of the classification in ASCE 31 and are defined in the Category 2 building types in the AB 300 Seismic Safety Inventory of California Public Schools report (2002).

Based on the table above, answer the second eligibility question in Section 1.

For each item below, give a brief response or description.

Horizontal system combinations	
Vertical system combinations	
SFRS foundation	
Gravity loading	***Describe the degree to which the SFRS elements also carry gravity load, distinguishing as appropriate between elements on different frame lines or in different directions.***
System details	***Give a brief description of the typical and critical SFRS elements in each direction to supplement the description by type. For example, describe column and girder sizes, infill thickness, spacing of roof-to-wall ties, etc.***
Structural materials	***List concrete, rebar, and masonry specified material properties, as well as the source of information, citing documents by Set ID and page/detail as listed in Section 2.3. See ASCE 31 section 2.2 for default values.***
Original design code	
History of seismic retrofit or significant alteration	***For purposes of this report, "significant alteration" means work that could have affected the building's seismic demands by changing the weight or the distribution of story shear or overturning forces. It would generally not include replacement of finishes, upgrade of HVAC equipment (except possibly for heavy tanks or rooftop units), or architectural work that did not involve changes to structural elements. If applicable, describe the changes to structural elements.*** ***If applicable, give the retrofit design code/criteria/performance objective, as well as dates and reference to Set ID(s) in Section 2.3.***
Benchmark year check	***Refer to ASCE 31 section 3.2. Indicate whether structure qualifies for benchmark year exemption.***

4. Deficiency list

The following table summarizes the potential deficiencies identified in Section 5 of this report.

Other deficiencies might exist. The evaluation was stopped once critical deficiencies were identified.

Delete this paragraph if either of the following is true:

- ***No critical deficiencies were identified***
- ***Critical deficiencies were identified, but the evaluation was completed anyway.***

Instructions for the tables below: In the column labeled "Additional evaluation recommended," indicate whether additional work would likely result in the potential deficiency being removed from the list. There is no need to provide details or scope. Possible entries in this column are

- ***None***
- ***Tier 2 evaluation***
- ***Additional non-destructive investigation***
- ***Destructive investigation***
- ***Material testing***

Non-compliant condition	Discussion	Additional evaluation recommended
Restate in this column the titles of each evaluation statement marked NC.	***For each item, describe:*** • ***The extent of non-compliance: Isolated? Widespread? Only in certain directions, along certain lines, in certain stories?*** • ***Expected collapse mechanism (local, story, global, etc.) associated with this deficiency.*** • ***Additional general discussion and reasoning regarding collapse potential.***	

Unknown condition	Discussion	Additional evaluation recommended
Restate in this column the titles of each evaluation statement marked U.	***For each item, describe:*** • ***The extent of non-compliance: Isolated? Widespread? Only in certain directions, along certain lines, in certain stories?*** • ***Expected collapse mechanism (local, story, global, etc.) associated with this deficiency.*** • ***Additional general discussion and reasoning regarding collapse potential.***	

5. ASCE 31 Evaluation Statements

Evaluation statements provided in this section are from ASCE 31. They have been modified for this project with DSA approval as described in Section 2.2 of this report. References within the evaluation statements to other section numbers are generally to sections of ASCE 31.

C = Compliant
NC = Non-compliant
U = Unknown or not investigated
NA = Not applicable to this building

Items marked NC or U are summarized in Section 4 of this report.

- ***For each evaluation statement, indicate C, NC, U, or NA.***
- ***Recommended means of indicating C, NC, U, or NA: Do not insert a circle or other graphic element that could get separated from the text. Instead, in Word, select the response and use "Borders and Shading" to put a box/border around just the selected text.***

CRITICAL ITEMS and TIER 2 EVALUATION:

- ***Certain statements are labeled "critical" (see Section 1 and 2.2). For any critical item found NC by Tier 1, a Tier 2 evaluation is required, as shown.***
- ***If a critical item is found NC by Tier 1 and confirmed as NC by Tier 2 evaluation, the balance of the evaluation statements need not be completed. In these cases, do NOT indicate C, NC, U, or NA for the evaluation statements skipped.***
- ***When performing Quick Checks or Tier 2 evaluations, use the ASCE 31 criteria for Life Safety (not Immediate Occupancy). In addition, where m values are needed, increase the m value given by ASCE 31 for Life Safety by a factor of 1.33.***

IMPORTANT:

- ***For each evaluation statement, provide a brief note below the statement citing the source of the information that justifies or explains NC or U. Refer to the Set ID and page/detail as listed in Section 2.3. Where applicable, provide additional discussion, Quick Check calculation, etc.***
- ***For all "Condition of Materials" evaluation statements, the required note regarding source of information should indicate where in the building exposed structural materials were observed.***
- ***Lengthy explanations, Tier 2 calculations, photos, etc. may be added here if convenient to do so in Word format. Otherwise, provide those in the Appendix A.2 and provide a reference to the appendix here. Clearly describe the non complying item in Appendix A.2.***

CONDITION OF MATERIALS	
C NC U NA	DETERIORATION OF WOOD. There shall be no evidence of or reason to suspect structural capacity loss due to decay, shrinkage, splitting, fire damage, or sagging in wood members or deterioration, damage, or loosening in metal connection hardware.

C NC U NA	DETERIORATION OF CONCRETE. There shall be no evidence of or reason to suspect structural capacity loss due to cracking of concrete or deterioration of concrete or reinforcing steel in gravity or seismic force-resisting elements.
C NC U NA	DETERIORATION OF STEEL. There shall be no evidence of or reason to suspect structural capacity loss due to rusting, corrosion, cracking, or other deterioration in any of the steel elements or connections in the gravity or seismic force-resisting elements.
C NC U NA	POST-TENSIONING ANCHORS. There shall be no evidence of or reason to suspect structural capacity loss due to corrosion or spalling in the vicinity of post-tensioning or end fittings. Coil anchors shall not have been used.
C NC U NA	PRECAST CONCRETE WALLS. There shall be no evidence of or reason to suspect structural capacity loss due to deterioration of concrete or reinforcing steel or distress, especially at connections.
C NC U NA	MASONRY UNITS. There shall be no evidence of or reason to suspect structural capacity loss due to deterioration of masonry units.
C NC U NA	MASONRY JOINTS. The mortar shall not be easily scraped away from the joints by hand with a metal tool, and there shall be no evidence of or reason to suspect structural capacity loss due to eroded mortar.
C NC U NA	MASONRY LAY-UP. Filled collar joints of multi-wythe masonry infill walls shall have negligible voids.
C NC U NA	FOUNDATION PERFORMANCE. There shall be no evidence of or reason to suspect existing foundation movement (due to settlement, heave, or other causes) that would affect the integrity or strength of the structure.
BUILDING CONFIGURATION	
C NC U NA Critical Item	LOAD PATH. The structure shall contain a minimum of one complete load path for seismic force effects from any horizontal direction that serves to transfer the inertial forces from the mass to the foundation. ***If the Tier 1 indication is NC or U, complete Section 4 and Section 1. There is no Tier 2 procedure for this item. In Section 4, provide a thorough description of the identified gaps in the load path and the expected failure modes associated with them.***

C NC U NA Critical Item	WEAK STORY. The strength of the seismic force-resisting system in any story shall not be less than 80% of the strength in an adjacent story, above or below. ***If the Tier 1 indication is NC or U, complete a Tier 2 check per ASCE 31 section 4.3.2.1 to confirm or revise. Describe the Tier 2 check here and in Appendices A.1 and/or A.2 as necessary.***
C NC U NA Critical Item	SOFT STORY. The stiffness of the seismic force-resisting system in any story shall not be less than 70% of the seismic force-resisting system stiffness in an adjacent story above or below, or less than 80% of the average seismic force-resisting system stiffness of the three stories above or below. ***If the Tier 1 indication is NC or U, complete a Tier 2 check per ASCE 31 section 4.3.2.2 to confirm or revise. Describe the Tier 2 check here and in Appendices A.1 and/or A.2 as necessary.***
C NC U NA	GEOMETRY. There shall be no changes in horizontal dimension of the seismic force-resisting system of more than 30% in a story relative to adjacent stories, excluding one-story penthouses and mezzanines.
C NC U NA Critical Item	VERTICAL DISCONTINUITIES. All vertical elements of the seismic force-resisting system shall be continuous to the foundation. ***If the Tier 1 indication is NC or U, complete a Tier 2 check per ASCE 31 section 4.3.2.4 to confirm or revise. Describe the Tier 2 check here and in Appendices A.1 and/or A.2 as necessary.***
C NC U NA Critical Item	MASS. There shall be no change in effective mass more than 50% from one story to the next. Light roofs, penthouses and mezzanines need not be considered. ***If the Tier 1 indication is NC or U, complete a Tier 2 check per ASCE 31 section 4.3.2.5 to confirm or revise. Describe the Tier 2 check here and in Appendices A.1 and/or A.2 as necessary.***
C NC U NA Critical Item	TORSION. The estimated distance between the story center of mass and the story center of rigidity shall be less than 20% of the building width in either plan dimension. ***If the Tier 1 indication is NC or U, complete a Tier 2 check per ASCE 31 section 4.3.2.6 to confirm or revise. Describe the Tier 2 check here and in Appendices A.1 and/or A.2 as necessary.***

C NC U NA Critical Item	ADJACENT BUILDINGS. The clear distance between the building being evaluated and any adjacent building shall be greater than 4% of the height of the shorter building. Alternatively, if the 4% separation does not exist, the two buildings shall be configured such that pounding would not damage the columns of the subject building within the clear span of the columns. ***If the Tier 1 indication is NC or U, AND THE BUILDINGS ARE CONFIGURED SUCH THAT POUNDING WOULD DAMAGE THE COLUMNS OF THE SUBJECT BUILDING WITHIN THEIR CLEAR HEIGHT BETWEEN FLOORS, then this is a potentially Critical Item. Complete a Tier 2 check per ASCE 31 section 4.3.1.2 to confirm or revise. Describe the Tier 2 check here and in Appendices A.1 and/or A.2 as necessary.***
C NC U NA Critical Item	MEZZANINES. Interior mezzanine levels shall be braced independently from the main structure, or shall be anchored to the seismic force-resisting elements of the main structure. ***If the Tier 1 indication is NC or U, AND THE MEZZANINE IS OVER AN EXIT OR AN ASSEMBLY OCCUPANCY (such as in an auditorium), then this is a potentially critical item. Complete a Tier 2 check, per ASCE 31 section 4.3.1.3 to confirm or revise. Describe the Tier 2 check here and in Appendices A.1 and/or A.2 as necessary.***
MOMENT FRAMES	
C NC U NA Critical Item	SHEAR STRESS CHECK (Columns). The shear stress in concrete columns of the seismic force-resisting system, calculated using the Quick Check procedure of Section 3.5.3.2, shall be less than the greater of 100 psi or $2\sqrt{f'_c}$. ***If the Tier 1 indication is NC or U, complete a Tier 2 check per ASCE 31 section 4.4.1.4.1 to confirm or revise. Describe the Tier 2 check here and in Appendices A.1 and/or A.2 as necessary.***
C NC U NA Critical Item	AXIAL STRESS CHECK (Concrete columns). The axial stress due to gravity loads in columns subjected to seismic overturning forces shall be less than $0.10f'_c$. Alternatively, the axial stresses due to overturning forces alone, calculated using the Quick Check procedure of Section 3.5.3.6, shall be less than $0.30f'_c$. ***If the Tier 1 indication is NC or U, complete a Tier 2 check per ASCE 31 section 4.4.1.4.2 to confirm or revise. Describe the Tier 2 check here and in Appendices A.1 and/or A.2 as necessary.***
C NC U NA	AXIAL STRESS CHECK (Steel columns). The axial stress due to gravity loads in steel columns subjected to seismic overturning forces shall be less than $0.10F_y$. Alternatively, the axial stresses due to overturning forces alone, calculated using the Quick Check procedure of Section 3.5.3.6, shall be less than $0.30F_y$.

C NC U NA Critical Item	FLAT SLAB FRAMES. The seismic force-resisting system shall not be a frame consisting of columns and a flat slab/plate without beams. ***If the Tier 1 indication is NC or U, complete a Tier 2 check per ASCE 31 section 4.4.1.4.3 to confirm or revise. Describe the Tier 2 check here and in Appendices A.1 and/or A.2 as necessary.***
C NC U NA	PRESTRESSED FRAME ELEMENTS. The seismic force-resisting frames shall not include any prestressed or post-tensioned elements where the average prestress exceeds the lesser of 700 psi or $f'_c/6$ at potential hinge locations. The average prestress shall be calculated in accordance with the Quick Check Procedure of Section 3.5.3.8.
C NC U NA Critical Item	CAPTIVE COLUMNS. There shall be no columns at a level with height/depth ratios less than 50% of the nominal height/depth ratio of the typical columns at that level. ***If the Tier 1 indication is NC or U, complete a Tier 2 check per ASCE 31 section 4.4.1.4.5 to confirm or revise. Describe the Tier 2 check here and in Appendices A.1 and/or A.2 as necessary.***
C NC U NA	NO SHEAR FAILURES. The shear capacity of frame members in the seismic force-resisting system shall be able to develop the moment capacity at the ends of the members.
C NC U NA	STRONG COLUMN/WEAK BEAM. The sum of the moment capacity of the columns shall be 20% greater than that of the beams at concrete frame joints.
C NC U NA	STRONG COLUMN/WEAK BEAM. The percent of strong column/weak beam joints in each story of each line of steel moment-resisting frames shall be greater than 50%. This check need not apply for 1-story structures.
C NC U NA Critical Item	BEAM BARS. At least two longitudinal top and two longitudinal bottom bars shall extend continuously throughout the length of each frame beam. ***If the Tier 1 indication is NC or U, complete a Tier 2 check per ASCE 31 section 4.4.1.4.8 to confirm or revise. Describe the Tier 2 check here and in Appendices A.1 and/or A.2 as necessary.***
C NC U NA	COLUMN BAR SPLICES. All column bar lap splice lengths shall be greater than $35d_b$, and shall be enclosed by ties spaced at or less than $8d_b$. Alternatively, column bars shall be spliced with mechanical couplers with a capacity of at least 1.25 times the nominal yield strength of the spliced bar.
C NC U NA	BEAM BAR SPLICES. The lap splices or mechanical couplers for longitudinal beam reinforcing shall not be located within $l_b/4$ of the joints and shall not be located in the vicinity of potential plastic hinge locations.

C NC U NA	COLUMN TIE SPACING. Frame columns shall have ties spaced at or less than d/4 throughout their length and at or less than $8d_b$ at all potential plastic hinge locations.
C NC U NA	STIRRUP SPACING. All beams shall have stirrups spaced at or less than d/2 throughout their length. At potential plastic hinge locations stirrups shall be spaced at or less than the minimum of $8d_b$ or d/4.
C NC U NA	JOINT REINFORCING. Beam-column joints shall have ties spaced at or less than $8d_b$.
C NC U NA	COMPLETE FRAMES. Concrete frames that are not part of the seismic force-resisting system shall form a complete gravity load carrying system.
C NC U NA Critical Item	DEFLECTION COMPATIBILITY. Elements of concrete frames that are not part of the seismic force-resisting system shall have the shear capacity to develop the flexural strength of the components. ***If the Tier 1 indication is NC or U, complete a Tier 2 check per ASCE 31 section 4.4.1.6.2 to confirm or revise. Describe the Tier 2 check here and in Appendices A.1 and/or A.2 as necessary.***
C NC U NA Critical Item	FLAT SLABS. Flat slabs/plates that are not part of the seismic force-resisting system shall have continuous bottom steel through the column joints. ***If the Tier 1 indication is NC or U, complete a Tier 2 check per ASCE 31 section 4.4.1.6.3 to confirm or revise. Describe the Tier 2 check here and in Appendices A.1 and/or A.2 as necessary.***
C NC U NA Critical Item	REDUNDANCY (Moment frame). The number of lines of moment frames in each principal direction shall be greater than or equal to 2. ***If the Tier 1 indication is NC or U, complete a Tier 2 check per ASCE 31 section 4.4.1.1.1 to confirm or revise. Describe the Tier 2 check here and in Appendices A.1 and/or A.2 as necessary.***
C NC U NA	INTERFERING WALLS. All concrete and masonry infill walls placed in moment frames shall be isolated from structural elements. (This evaluation statement does not apply to seismic force-resisting system type C3A or others where the infill is being evaluated as a shear wall or force-resisting element.)
C NC U NA	PRECAST CONNECTION CHECK. The connections at joints of precast concrete frames shall have the capacity to resist the shear and moment demands calculated using the Quick Procedure of Section 3.5.3.5
C NC U NA	PRECAST FRAMES. For buildings with concrete shear walls, precast concrete frame elements shall not be necessary as primary components for resisting seismic forces.
C NC U NA	PRECAST CONNECTIONS. For buildings with concrete shear walls, the connections between precast frame elements such as chords, ties, and collectors in the seismic force-resisting system shall develop the capacity of the connected members.

C NC U NA	DRIFT CHECK: The drift ratio of the steel moment frames, calculated using the Quick Check procedure of Section 3.5.3.1, shall be less than 0.025.
C NC U NA	MOMENT-RESISTING CONNECTIONS: All moment connections shall be able to develop the strength of the adjoining members or panel zones.
C NC U NA	PANEL ZONES: All panel zones shall have the shear capacity to resist the shear demand required to develop 0.8 times the sum of the flexural strengths of the girders framing in at the face of the column.
C NC U NA	COLUM SPLICES: All column splice details located in moment-resisting frames shall include connection of both flanges and the web.
C NC U NA	COMPACT MEMBERS: All frame elements shall meet section requirements set forth by Table I-9-1 of Seismic Provisions for Structural Steel Buildings (AISC, 1997).
SHEAR WALLS	
C NC U NA Critical Item	UNREINFORCED MASONRY BEARING WALLS. The seismic force-resisting system in any direction shall not rely on or consist primarily of unreinforced masonry bearing walls. ***If the Tier 1 indication is NC, complete Section 4 and Section 1. There is no Tier 2 procedure for this item. In Section 4, provide a complete description of any existing retrofit elements, including parapet braces, wall-to-floor anchors, strongbacks, etc.***
C NC U NA Critical Item	SHEAR STRESS CHECK (Shear wall). The shear stress in the concrete shear walls, calculated using the Quick Check procedure of Section 3.5.3.3, shall be less than the greater of 100 psi or $2\sqrt{f'_c}$. ***If the Tier 1 indication is NC or U, complete a Tier 2 check per ASCE 31 section 4.4.2.2.1 to confirm or revise. Describe the Tier 2 check here and in Appendices A.1 and/or A.2 as necessary.***
C NC U NA	REINFORCING STEEL. In concrete or precast shear walls, the ratio of reinforcing steel area to gross concrete area shall be not less than 0.0015 in the vertical direction and 0.0025 in the horizontal direction. The spacing of reinforcing steel shall be equal to or less than 18 inches.
C NC U NA	COUPLING BEAMS. The stirrups in coupling beams over means of egress shall be spaced at or less than d/2 and shall be anchored into the confined core of the beam with hooks of 135º or more.
C NC U NA Critical Item	REDUNDANCY (Shear wall). The number of lines of shear walls in each principal direction shall be greater than or equal to 2. ***If the Tier 1 indication is NC or U, complete a Tier 2 check per ASCE 31 section 4.4.2.1.1 to confirm or revise. Describe the Tier 2 check here and in Appendices A.1 and/or A.2 as necessary.***

C NC U NA	PROPORTIONS. The height-to-thickness ratio of masonry infill walls at each story shall be less than 9. (This evaluation statement applies only to seismic force-resisting system type C3A and others where the infill is being evaluated as a shear wall or force-resisting element.)
C NC U NA	SOLID WALLS. The masonry infill walls shall not be of cavity construction. (This evaluation statement applies only to seismic force-resisting system type C3A and others where the infill is being evaluated as a shear wall or force-resisting element.)
C NC U NA	INFILL WALLS. The infill walls shall be continuous to the soffits of the frame beams and to the columns to either side. (This evaluation statement applies only to seismic force-resisting system type C3A and others where the infill is being evaluated as a shear wall or force-resisting element.)
C NC U NA Critical Item	SHEAR STRESS CHECK (Precast concrete shear walls). The shear stress in the precast panels, calculated using the Quick Check procedure of Section 3.5.3.3, shall be less than the greater of 100 psi or $2\sqrt{f'_c}$. ***If the Tier 1 indication is NC or U, complete a Tier 2 check per ASCE 31 section 4.4.2.3.1 to confirm or revise. Describe the Tier 2 check here and in Appendices A.1 and/or A.2 as necessary.***
C NC U NA	WALL OPENINGS. The total width of openings along any perimeter wall line shall constitute less than 75% of the length of any perimeter shear wall, with the wall piers having height-to-width ratios of less than 2 to 1.
C NC U NA	CORNER OPENINGS. Walls with openings at a building corner larger than the width of a typical panel shall be connected to the remainder of the wall with collector reinforcing.
C NC U NA Critical Item	SHEAR STRESS CHECK (Brick or hollow clay masonry infill). The shear stress in the masonry shear walls, calculated using the Quick Check procedure of Section 3.5.3.3, shall be less than 30 psi for clay units. ***If the Tier 1 indication is NC or U, complete a Tier 2 check per ASCE 31 section 4.4.2.5.1, to confirm or revise. Describe the Tier 2 check here and in Appendices A.1 and/or A.2 as necessary.***
C NC U NA Critical Item	SHEAR STRESS CHECK (Concrete block infill and reinforced masonry shear walls). The shear stress in the masonry shear walls, calculated using the Quick Check procedure of Section 3.5.3.3, shall be less than 70 psi for concrete units. ***If the Tier 1 indication is NC or U, complete a Tier 2 check per ASCE 31 section 4.4.2.4.1 to confirm or revise. Describe the Tier 2 check here and in Appendices A.1 and/or A.2 as necessary.***
C NC U NA	PROPORTIONS. The height-to-thickness ratio of unreinforced masonry infill shear walls shall be less than the following: Top story of multi-story building: 9, First story of multi-story building: 15, All other conditions: 13

C NC U NA	REINFORCING STEEL. In reinforced masonry shear walls, the total vertical and horizontal reinforcing steel ratio shall be greater than 0.002 of the wall with the minimum of 0.0007 in either of the two directions; the spacing of reinforcing steel shall be less than 48"; and all vertical bars shall extend to the top of the walls.
BRACED FRAMES	
C NC U NA Critical Item	REDUNDANCY: The number of lines of braced frames in each principal direction shall be greater than or equal to 2. ***If the Tier 1 indication is NC or U, complete a Tier 2 check per ASCE 31 section 4.4.3.1.1 to confirm or revise. Describe the Tier 2 check here and in Appendices A.1 and/or A.2 as necessary.***
C NC U NA Critical Item	AXIAL STRESS CHECK: The axial stress in the diagonals, calculated using the Quick Check Procedure of Section 3.5.3.4, shall be less than $0.50F_y$. ***If the Tier 1 indication is NC or U, complete a Tier 2 check per ASCE 31 section 4.4.3.1.2 to confirm or revise. Describe the Tier 2 check here and in Appendices A.1 and/or A.2 as necessary.***
C NC U NA	SLENDERNESS OF DIAGONALS: All diagonal elements required to carry compression shall have Kl/r ratios less than 120.
C NC U NA	CONNECTION STRENGTH: All the brace connections shall develop the yield capacity of the diagonals.
C NC U NA	K-BRACING: The bracing system shall not include K-braced bays.
DIAPHRAGMS	
C NC U NA	DIAPHRAGM CONTINUITY. The diaphragm shall not be composed of split-level floors and shall not have expansion joints.
C NC U NA	CROSS TIES. There shall be continuous cross ties between diaphragm chords.
C NC U NA	ROOF CHORD CONTINUITY. All roof chord elements shall be continuous, regardless of changes in roof elevation.

C NC U NA Critical Item	OPENINGS AT SHEAR WALLS. Diaphragm openings immediately adjacent to the shear walls shall be less than 25% of the wall length, and diaphragm openings immediately adjacent to exterior masonry shear walls shall not be greater than 8 ft long. ***If the Tier 1 indication is NC or U, complete a Tier 2 check per ASCE 31 section 4.5.1.4 or 4.5.1.6, as applicable, to confirm or revise. Describe the Tier 2 check here and in Appendices A.1 and/or A.2 as necessary.***
C NC U NA	OPENINGS AT BRACED FRAMES. Diaphragm openings immediately adjacent to the braced frames shall extend less than 25% of the frame length.
C NC U NA	OTHER DIAPHRAGMS. The diaphragm shall not consist of a system other than wood, metal deck, concrete or horizontal bracing.
C NC U NA Critical Item	TOPPING SLAB. Precast concrete diaphragm elements shall be interconnected by a continuous reinforced concrete topping slab. ***If the Tier 1 indication is NC or U, complete a Tier 2 check per ASCE 31 section 4.5.5.1 to confirm or revise. Describe the Tier 2 check here and in Appendices A.1 and/or A.2 as necessary.***
C NC U NA	STRAIGHT SHEATHING. All straight sheathed diaphragms shall have aspect ratios less than 2 to 1 in the direction being considered.
C NC U NA	SPANS. All wood diaphragms with spans greater than 24 ft shall consist of wood structural panels or diagonal sheathing.
C NC U NA	UNBLOCKED DIAPHRAGMS. All diagonally sheathed or unblocked wood structural panel diaphragms shall have horizontal spans less than 40 ft and shall have aspect ratios less than or equal to 4 to 1.
CONNECTIONS	
C NC U NA Critical Item	WALL ANCHORAGE. Exterior concrete or masonry walls shall be anchored for out-of-plane forces at each diaphragm level with steel anchors, reinforcing dowels, or straps developed into the diaphragm. Connections shall have adequate strength to resist the connection force calculated in the Quick Check procedure of Section 3.5.3.7. ***If the Tier 1 indication is NC or U, complete a Tier 2 check per ASCE 31 section 4.6.1.1 to confirm or revise. Describe the Tier 2 check here and in Appendices A.1 and/or A.2 as necessary.***
C NC U NA	WOOD LEDGERS. The connection between the wall panels and the diaphragm shall not induce cross-grain bending or tension in the wood ledgers.

C NC U NA	PRECAST PANEL CONNECTIONS. There shall be at least two anchors from each precast wall panel into the diaphragm elements.
C NC U NA	STIFFNESS OF WALL ANCHORS. Anchors of concrete or masonry walls to wood structural elements shall be installed taut and shall be stiff enough to limit the relative movement between the wall and the diaphragm prior to engagement of the anchors, as needed for reliable bearing.
C NC U NA	GIRDER/COLUMN CONNECTION. There shall be a positive connection utilizing plates, connection hardware, or straps between girders and their supporting columns. (This evaluation statement applies primarily to precast concrete and masonry systems.)
C NC U NA	GIRDERS. Girders supported by walls or pilasters shall have at least two additional column ties securing the anchor bolts. (This evaluation statement applies primarily to precast concrete systems.)
C NC U NA	CORBEL BEARING. If precast concrete frame girders bear on column corbels, the length of bearing shall be greater than 3”.
C NC U NA	CORBEL CONNECTIONS. Precast concrete frame girders shall not be connected to corbels with welded elements.
C NC U NA	TRANSFER TO SHEAR WALLS. Diaphragms shall be connected for transfer of loads to shear walls.
C NC U NA	TRANSFER TO STEEL FRAMES. Diaphragms shall be connected for transfer of loads to the steel frames.
C NC U NA	TOPPING SLAB TO WALLS OR FRAMES. Reinforced concrete topping slabs that interconnect the precast concrete diaphragm elements shall be doweled for transfer of forces into shear wall or frame elements.
C NC U NA	CONCRETE COLUMNS. All concrete columns shall be doweled into the foundation.
C NC U NA	FOUNDATION DOWELS. Wall reinforcement shall be doweled into the foundation.
C NC U NA	PRECAST WALL PANELS. Precast wall panels shall be connected to the foundation.
C NC U NA	UPLIFT AT PILE CAPS. Pile caps shall have top reinforcement and piles shall be anchored to the pile caps.
C NC U NA	STEEL COLUMNS: The columns in lateral-force-resisting frames shall be anchored to the building foundation.

C NC U NA	WALL PANELS: Metal, fiberglass or cementitious wall panels shall be positively attached to the foundation.
C NC U NA	ROOF PANELS: Metal, plastic, or cementitious roof panels shall be positively attached to the roof framing to resist seismic forces.
C NC U NA	WALL PANELS: Metal, fiberglass or cementitious wall panels shall be positively attached to the framing to resist seismic forces.
FOUNDATION	
C NC U NA	POLE FOUNDATIONS. Pole foundations shall have a minimum embedment depth of 4 ft.
C NC U NA	TIES BETWEEN FOUNDATION ELEMENTS. The foundation shall have ties adequate to resist seismic forces where footings, piles, and piers are not restrained by beams, slabs, or soils in Site Class A, B, or C.

GEOLOGIC SITE HAZARDS	
C NC U NA Critical Item	LIQUEFACTION: Liquefaction-susceptible, saturated, loose granular soils that could jeopardize the building's seismic performance shall not exist in the foundation soils at depths within 50 feet. ***If the Tier 1 indication is NC or U, complete a Tier 2 check per ASCE 31 section 4.7.1.1 to confirm or revise. Describe the Tier 2 check here and in Appendices A.1 and/or A.2 as necessary.*** ***The Tier 2 check shall include a structural analysis demonstrating high potential for local or global collapse in the evaluation earthquake as a result of the liquefaction. The structural analysis shall consider the displacements imposed on the structure and shall be based on a CGS approved geologic hazard report in accordance with the Appendix in DSA Procedure 08-03.***
C NC U NA Critical Item	SLOPE FAILURE: The building site shall be sufficiently remote from potential earthquake-induced slope failures or rockfalls to be unaffected by such failures or shall be capable of accommodating any predicted movements without failure. ***If the Tier 1 indication is NC or U, complete a Tier 2 check per ASCE 31 section 4.7.1.2 to confirm or revise. Describe the Tier 2 check here and in Appendices A.1 and/or A.2 as necessary.*** ***The Tier 2 check shall include a structural analysis demonstrating high potential for local or global collapse in the evaluation earthquake as a result of the slope failure. The structural analysis shall consider the displacements imposed on the structure and shall be based on a CGS approved geologic hazard report in accordance with the Appendix in DSA Procedure 08-03.***
C NC U NA Critical Item	SURFACE FAULT RUPTURE: Surface fault rupture and surface displacement at the building site is not anticipated. ***If the Tier 1 indication is NC or U, complete a Tier 2 check per ASCE 31 section 4.7.1.3 to confirm or revise. Describe the Tier 2 check here and in Appendices A.1 and/or A.2 as necessary.*** ***The Tier 2 check shall include a structural analysis demonstrating high potential for local or global collapse in the evaluation earthquake as a result of the surface rupture. The structural analysis shall consider the displacements imposed on the structure and shall be based on a CGS approved geologic hazard report in accordance with the Appendix in DSA Procedure 08-03.***

Appendices

Provide calculations or calc summary directly in Word format, or insert graphics/screeenshots from spreadsheet, hand calculations, etc.

Alternatively, if appendix materials are provided in a separate file, use this section to provide a table of contents or guide to that file indicating what's in it and how many pages it is. If a separate file is provided, each of its pages must include all of the identifying information shown in the header and footer to this report.

A.1 Structural calculations

Provide the general calculations as needed to complete the evaluation of Section 5. These will likely include weight take-offs, period calculation, base shear calculation and distribution, and general analysis results (such as story shear distributions by frame line).

A.2 Evaluation statement notes

Provide calculations and supporting information needed to complete the response to specific evaluation statements. As noted in Section 5, brief calculations or explanations should go in Section 5. If this appendix section is used, organize it by the title of the Evaluation Statements. It is acceptable to omit Evaluation Statements from this appendix if no information is needed to supplement what's already provided in Section 5.

A.3 Photographs and details

Provide additional photographs or graphic information, with captions, in this optional appendix.